



A Metzger/McGuire Technical Advisory for Floor Designers ***Should An Architect or Engineer Approve Polyurea Floor Joint Fillers*** ***at Less Than Full Depth Over Backer Rod?***

Contractors are increasingly submitting for approval polyurea industrial floor joint fillers. The tech data on some of these fillers calls for the use of a compressible backer rod to limit the filler depth. Should you approve these polyureas, and thus approve their recommended installation procedure? Here are some facts to consider before you decide:

Non-Compliance with ACI and PCA Filler Depth Criteria

The American Concrete Institute and the Portland Cement Association (PCA) are the accepted authorities on concrete floor design and construction. Documents from both mandate that saw cut joints in industrial floors be filled full depth. This is because any compressible rod placed below the filler or any other non-structural base offers inadequate filler support, leaving the filler susceptible to deflection and exposing the joints edges to impact. If the floor joint edges deteriorate and claims arise as a result of less-than-full-depth filling, these documents will likely be used against the designer.

Non-Compliance with ACI and PCA Filler Hardness Criteria

Polyurea fillers that call for the use of compressible backer rod to control depth generally have a hardness of Shore A75 or lower. ACI and PCA documents mandate that industrial floor joint fillers must have a “minimum” hardness of Shore A80. In case of claims for deteriorated joints, ACI and PCA documents could again be used against the designer.

Fillers Cannot Be Both Stiff and Flexible

Why is backer rod recommended? The manufacturer’s theory is that limiting the filler depth increases its ability to expand laterally. This is true, and is the reason that polyurethanes and elastomeric sealants, chosen for lateral movement, are installed in this manner. But it’s important to remember that industrial floor joint fillers are designed to “fill” not “seal” a joint. If a filler is flexible enough to expand substantially, it is also flexible enough to deflect under hard wheel traffic, exposing the joint edges to damage as loads cross the joint. If the filler doesn’t protect the joint edges, it has no value in an industrial floor. Result; designer vulnerability.

The Promise of Expansion is Implausible

If you specify sealants for vertical walls you know that a typical polyurethane sealant (Shore A35) has a maximum expansion capability of approximately 30%, with an optimum 2:1 width/depth ratio. An industrial floor joint which is cut 1/8” wide will typically open to about 3/16” at the time of filling and about 1/4” at about one year after pour. This means that the post-filling expansion of the slab joints is about 33%. If a Shore A35 elastomer with a 2:1 width/depth ratio can’t tolerate typical floor joint opening, how can a Shore A75 polyurea with a 1:4 width/depth ratio?

Even If It Works, It Fails

Let’s assume that an A75 polyurea does somehow handle the anticipated 33% joint expansion. When a flexible material expands it takes on an hourglass profile. In a horizontal joint this means

that the top of the filler will become concave in profile, leaving joint edges exposed and vulnerable to hard wheel impact and damage.

Conclusion

When you approve an applicator's request to use a polyurea over backer rod, you have nothing to gain. But you do expose your client to potentially severe joint damage and leave your firm vulnerable to financial claims resulting from the damage. Is it really worth the risk?

If you specify or are asked to approve a polyurea joint filler for industrial floors, just make sure that your approval is contingent upon two things:

1. A minimum Shore A80 hardness to comply with ACI & PCA
2. The polyurea is installed to the full depth of the saw cut and not placed over a compressible base (per ACI and PCA)

Ensuring that these requirements are met provides maximum protection for both the owner's floor and your reputation.